

1 CLAIMS

2 What is claimed is:

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- 4 1. A method comprising:
- 5 providing image data; and
- 6 performing a Hough transform on the image data using a host
- 7 processor and an operatively configured graphics processor.
- 8
- 9 2. The method as recited in Claim 1, wherein the graphics processor is
- 10 configured to count votes in a resulting Hough transform voting
- 11 buffer.
- 12
- 13 3. The method as recited in Claim 1, wherein the graphics processor is
- 14 configured to convolve image values and provide corresponding
- 15 results to the host processor.
- 16
- 17 4. The method as recited in Claim 1, wherein the graphics processor
- 18 performs an alpha-blending operation that selectively increments
- 19 accumulators that correspond to parameter combinations that are
- 20 likely associated with an observation.
- 21
- 22 5. The method as recited in claim 1, wherein the graphics processor
- 23 performs a histogram computation to find the maxima value in the
- 24 Hough transform voting buffer.
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- 1
- 2 6. An apparatus comprising:
- 3 a host processor configured to provide image data; and
- 4 a graphics processor operatively coupled to the host processor and
- 5 configured to perform selected steps of a Hough transform algorithm
- 6 on the image data in association with the host processor.
- 7
- 8 7. The apparatus as recited in Claim 6, further comprising a local
- 9 memory operatively coupled to the graphics processor and wherein
- 10 the graphics processor is configured to count votes in a resulting
- 11 Hough transform voting buffer within the local memory.
- 12
- 13 8. The apparatus as recited in Claim 6, wherein the graphics processor
- 14 is configured to convolve image values and provide corresponding
- 15 results to the host processor.
- 16
- 17 9. The apparatus as recited in Claim 6, further comprising a local
- 18 memory operatively coupled to the graphics processor and wherein
- 19 the graphics processor performs an alpha-blending operation that
- 20 selectively increments accumulators within the local memory that
- 21 correspond to parameter combinations that are likely associated with
- 22 an observation.
- 23
- 24 10. The apparatus as recited in claim 6, further comprising a local
- 25 memory operatively coupled to the graphics processor and wherein

the graphics processor performs a histogram computation to find the maxima value in the Hough transform voting buffer within the local memory.

11. A computer-readable medium having computer-executable instructions for performing steps comprising:
providing image data; and
performing a Hough transform on the image data using a host processor and an operatively configured graphics processor.
12. The computer-readable medium as recited in Claim 11, having computer-executable instructions that cause the graphics processor to count votes in a resulting Hough transform voting buffer.
13. The computer-readable medium as recited in Claim 11, having computer-executable instructions that cause the graphics processor is to convolve image values and provide corresponding results to the host processor.
14. The computer-readable medium as recited in Claim 11, having computer-executable instructions that cause the graphics processor to perform an alpha-blending operation that selectively increments accumulators that correspond to parameter combinations that are likely associated with an observation.

15. The computer-readable medium as recited in claim 11, having computer-executable instructions that cause the graphics processor to perform a histogram computation to find the maxima value in the Hough transform voting buffer.

16. A method comprising:

causing dedicated graphics hardware to support a at least one of the following steps associated with a Hough transform algorithm:

quantizing a bounded portion of a parameter space that may contain a desired feature;

for each discrete quantized parameter combination, allocating an incrementable accumulator;

gathering observations that can be mapped into the parameter space;

for each observation, incrementing each of the accumulators that corresponds to parameter combinations that may have produced the observation; and

determining the maxima in a resulting quantized parameter array and the corresponding parameter combinations.